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Central Bank Optimism as a Policy Tool: Evidence from the Bank of England

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Abstract

We evaluate the tone of optimism in the Bank of England's Monetary Policy Committee (MPC) communication using computerised textual analysis and then explore the impacts of optimism shocks on key macroeconomic variables. We show that innovations in optimism impact key macroeconomic variables in the same way that a contractionary monetary policy would. We find that increasing optimism shocks in MPC communication leads to rising inflation, falling output, declining stock market returns and a rise in the Pound value. We further find evidence that optimism shocks reduce credit availability, the money supply, retail sales as well as earnings. Finally, government bond yields also tend to rise in response to optimism shocks.

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Central Bank Communication

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Optimism

JEL Classification:

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E58

Introduction

Central Bank communication as a monetary policy tool has gained more prominence over the past couple of years as policy makers face a new wave of challenges brought about by near zero interest rates (the zero lower bound). The main dilemma faced by central bankers in such an environment is how to keep monetary policy going without the option of further reducing rates beyond the zero lower bound. In the same vein, communication by policy makers has been under more scrutiny as markets look to the central banks for guidance about future path of policy. This guidance is truly now being provided by central banks as a central policy theme and has become known as forward guidance. The implication of this is that every communication by Central Banks therefore becomes a calculated step, an intentional rhetoric. Indeed, the Bank of England (BoE) through its One Bank research agenda, stresses analysing policy communication as one of the frontier research areas it seeks to pursue imminently.

Although an increasing amount of work is being done on the role of communication in monetary policy, we seek to explore aspects of these that have received scant attention. Specifically, we focus on using textual analysis of the BoE's monetary policy communication to evaluate and quantify the level of optimism in their communication using computerised textual analytics software called Diction; we then explore how optimism shocks affect key macroeconomic variables. There is some evidence that central bank optimism impacts financial markets, however, only limited evidence exists on its greater impacts on the macro economy. For instance, Born et al (2014) using the Diction software similar to our analysis, find that the financial markets respond to central bank communication via reduced market volatility.

Therefore, using a Factor Augmented VAR (FAVAR) model similar to Bernanke et al (2005), we explore whether communication shocks from optimism are transmitted to key macroeconomic variables. We focus on several macroeconomic variables that are closely followed by economic agents and published by Bloomberg in their economic release calendar. Our intuition is that if there is a clearer understanding on the direction of shock transmission from communication to the macro environment, then communication could be better used as a policy tool. We argue that optimism is very important in a zero lower bound environment given that this sentiment can play a vital role in driving short term expectations in the desired direction of the bank. Particularly, the financial press over the past few years

has often been very critical of the level of central bank optimism communicated via policy documents as it supposedly helps them parse the potential for a central bank's rate rise. Generally, an increase in optimism is often viewed as a sign of movement in the direction of an interest rate rise and along the lines of a contractionary monetary policy.

Our study does indeed document interesting findings which mainly show that the optimism tone of the Bank drives economic variables in a way that is similar to a contractionary monetary policy. Consistent with economic theory, we find evidence that shocks to optimism leads to a decline in stock market returns, a fall in inflation, an increase in the value of the Pound and a decrease in other macroeconomic fundamentals related to output.

The FAVAR Methodology

The FAVAR approach is superior to the standard VAR in that it allows for the inclusion of more information into the VAR system without the degrees of freedom problem. In identifying the effects of optimism shocks on macroeconomic variables, we follow the two-step principal component approach by Bernanke et al (2005).

Suppose Y_t is an $M \times 1$ vector of variables that are assumed to drive the economy and are observable. Y_t could contain information relating to a policy variable (we assume optimism). In a standard VAR, Y_t in itself will be touted as the main variable driving the economy; however, Y_t data may not fully capture additional economic dimensions relevant to modelling the dynamics of macroeconomic policy. Within the FAVAR framework, these additional economic dimensions that are unobserved may be captured by a $K \times 1$ vector of unobserved factors F_t, where K is 'small'.

The structure of the dynamics between these two factors is given by:

$$\begin{bmatrix} F_t \\ Y_t \end{bmatrix} = \Phi(L) \begin{bmatrix} F_{t-1} \\ Y_{t-1} \end{bmatrix} + v_t \qquad \dots (1)$$

The above equation is a standard VAR in (F_t', Y_t') and could be estimated if we had observable values for F_t; however in this case, values of $F_t$are unobservable. Suppose however that we have a series of informational time series of economic variables denoted by

a $N \times 1$ vector of X_t. The informational time series X_t can be expressed as a function of the unobservable factors F_t as well as the observable factors Y_t in the form below:

$$X_t = \Lambda^f F_t + \Lambda^y Y_t + \varepsilon_t \quad \ldots (2)$$

In the first step of the two-step approach, we estimate $K + M$ principal components of X_t which is referred to as $\hat{C}(F_t, Y_t)$ and are linear combinations of F_t and Y_t. As Hansen and McMahon (2016) identify, this process is aimed at identifying the structural shocks to all of the Y_t variables but this cannot be done if estimated factors include the effects of Y_t. Therefore the effects of the Y_t variables we are interested in shocking will need to be eliminated from $\hat{C}(F_t, Y_t)$.

We follow the identification assumptions proposed by Bernanke et al (2005) and which has been used extensively in FAVAR models. Under the first identification assumption, two categories of information variables are identified namely, slow-moving variables and fast-moving variables. Slow-moving variables are often identified as those variables that do not respond contemporaneously to unanticipated changes in monetary policy (policy shocks). We then estimate the principal components of the slow moving X_t variables identified above. It is important to note that in the identification assumption above, Y_t does not react to these principal components. Given these, $\hat{C}(F_t, Y_t)$ can be identified as below:

$$\hat{C}(F_t, Y_t) = \beta_c \hat{C}^*(F_t) + \beta_y Y_t + \eta_t \quad \ldots (3)$$

Equation (3) is therefore estimated using standard OLS with principal components as regressors. Subsequently, F_t can be defined as:

$$\widehat{F_t} = \hat{C}(F_t, Y_t) - \beta_y Y_t \quad \ldots (4)$$

The second step of the two step FAVAR approach involves estimating a standard VAR in $\widehat{F_t}$ and Y_t of the form:

$$Z_t = \begin{bmatrix} \widehat{F_t} \\ X_t \\ Y_t \end{bmatrix} \quad \ldots (5)$$

With the reduced form being:

$$Z_t = AZ_{t-1} + v_t \ldots \quad \ldots (6)$$

Our inclusion of $\widehat{F_t}$ in the standard VAR helps significantly improve the information content of our standard VAR model. Technically, the impact of optimism is evaluated by means of a standard VAR from a structural model as below:

$$A\begin{pmatrix} X_t \\ Y_t \end{pmatrix} = C(L)\begin{pmatrix} X_{t-1} \\ Y_{t-1} \end{pmatrix} + B\begin{pmatrix} v_t^X \\ v_t^Y \end{pmatrix} \quad \dots (7)$$

Where X_t represents a vector of macroeconomic (non-policy) variables and Y_t represents the policy variables controlled by the policy makers which is hypothetically captured by optimism in our study. As with Bernanke et al (2015), for impulse response analysis, we order our policy variable last.

Data

To capture optimism in communication (Y_t), we use computerised textual analysis software called Diction which has been used extensively within the fields of applied computational linguistics as well as recently in analysing central bank communication for tone (see Born et al, 2012). The software uses a detailed database of 10,000 word corpus and user defined custom dictionaries that processes texts and converts the results to numeric files for statistical analysis. We focus mainly on Monetary Policy Committee (MPC) communications via MPC meeting minutes. Our sample uses monthly data which extends from the point where the BoE attained independence in 1997 and therefore obtained greater mandate for inflation targeting up until 2015, making up a total of 214 observations.

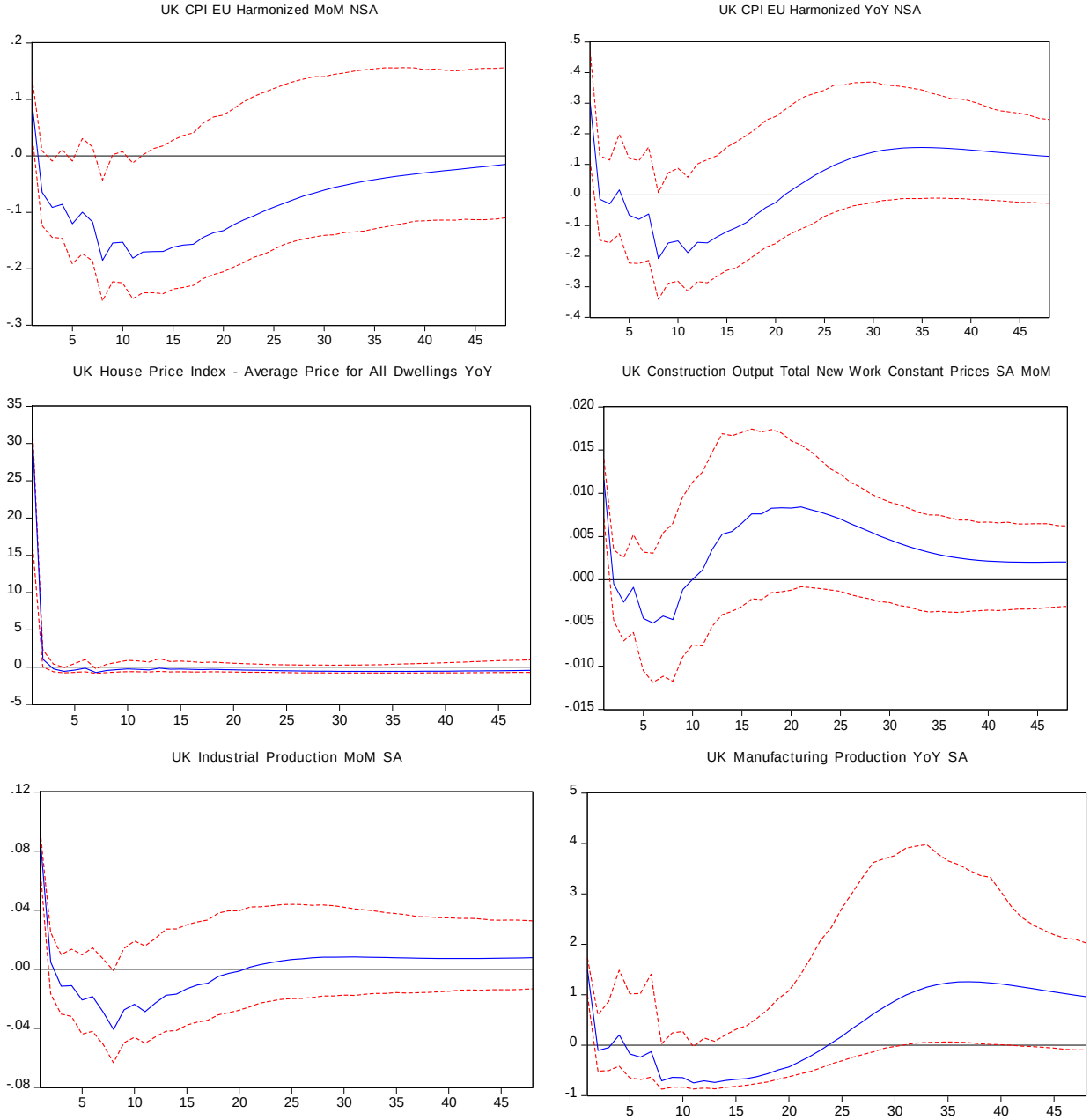
We use a total of 72 non-policy variables (X_t) which are obtained from Bloomberg but we only report the results of 24 of those variables that we deem to be more important and are significant. Our results section shows the impact of optimism shocks on some of these variables.

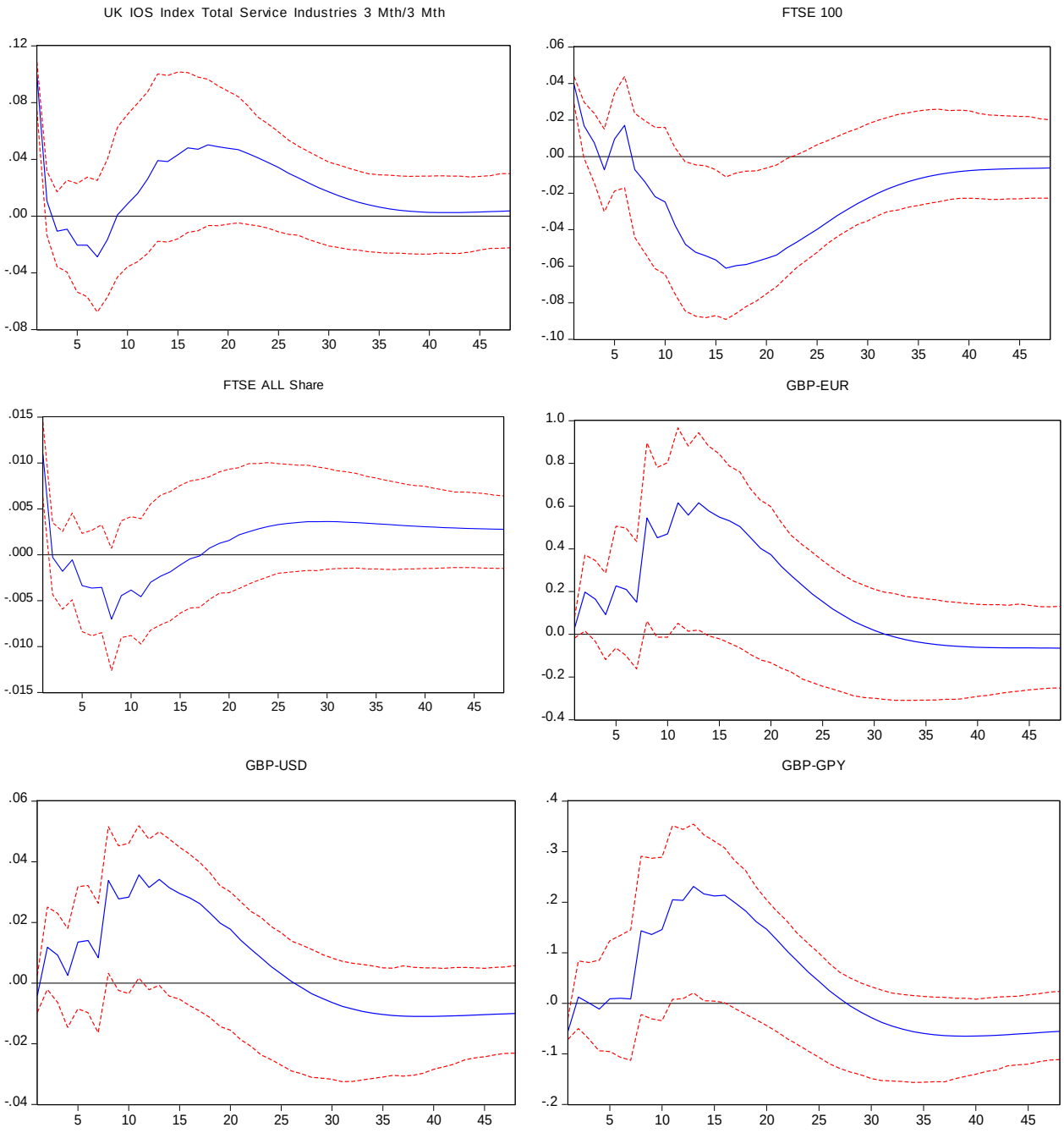
Results

Figure 1.0 shows the impulse response functions for our first set of key macroeconomic variables. We find consistent evidence that these macroeconomic variables react to optimism shocks similar to a contractionary monetary policy. Shocks to optimism tended to reduce inflation (CPI) for up to 10 months from impact and the house price index also falls sharply up to three months and then fades. Although our GDP measure turns out insignificant impulse responses, we document that several sub measures of output react

negatively to optimism shocks. Construction output, industrial production, manufacturing production and the index of services all decline for up to seven months following an optimism shock. The stock market as measured by the FTSE 100 returns as well as the FTSE All Share returns also react negatively as they would do with an interest rate hike. Finally, also similar to an interest rate rise, the Pound tends to gain value relative to the Euro, the Dollar and the Yen following a shock to optimism, albeit with lesser significance.

Figure 1.0: Impulse response to Optimism Shocks (Set 1)

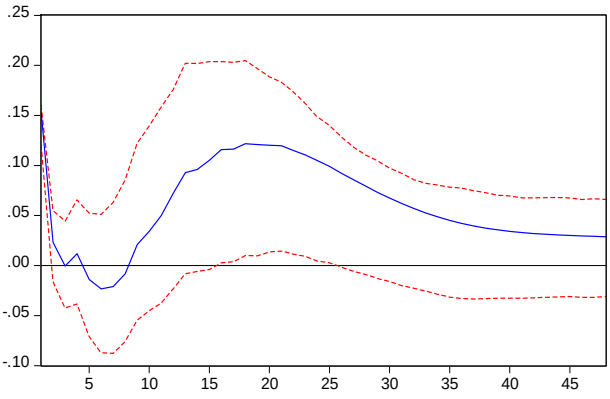




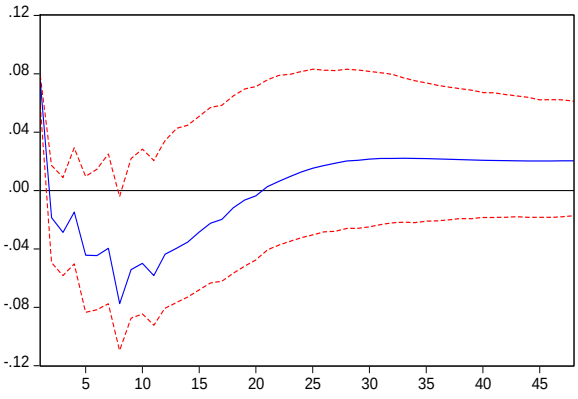
We further explore how a second set of relevant macroeconomic variables that are closely monitored by economic agents respond to optimism shocks. Figure 2 below shows impulse response functions for these variables. We find evidence of a credit squeeze which is typical of interest rate rise following shocks to optimism. Specifically, the number of mortgage approvals, consumer credit supplied and money supply all show significant declines after an optimism shock. Retail sales and wage metrics also demonstrate a significant decline.

Figure 2.0: Impulse response to Optimism Shocks (Set 2)

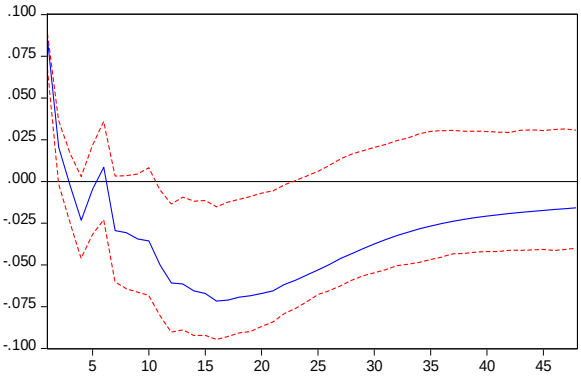
Bank of England UK Mortgage Approvals



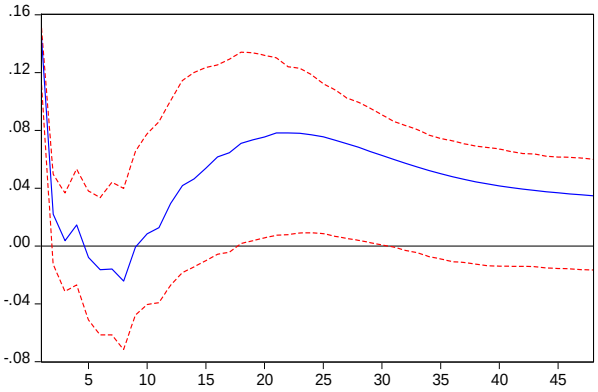
UK Consumer Credit Supplied (Ex SLC) SA



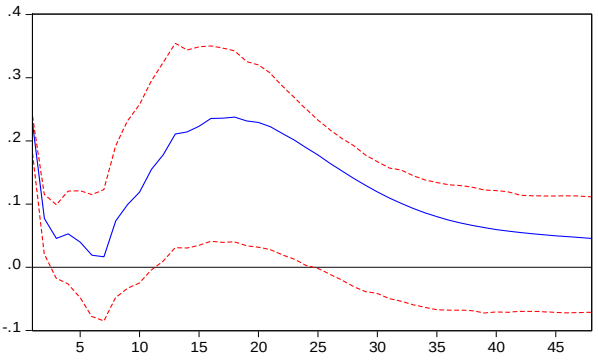
UK Money Supply M4 MoM SA



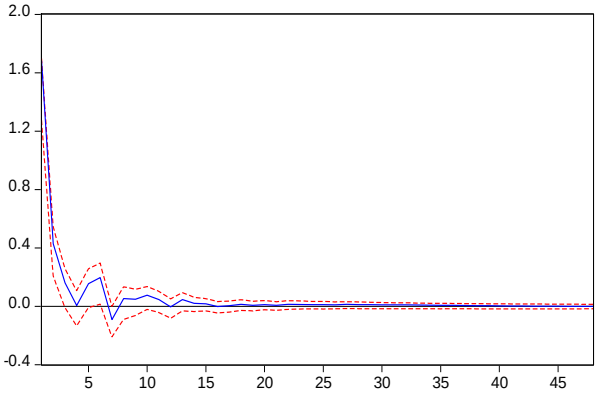
BRC KPMG Retail Sales Monitor Like For Like Sales YoY



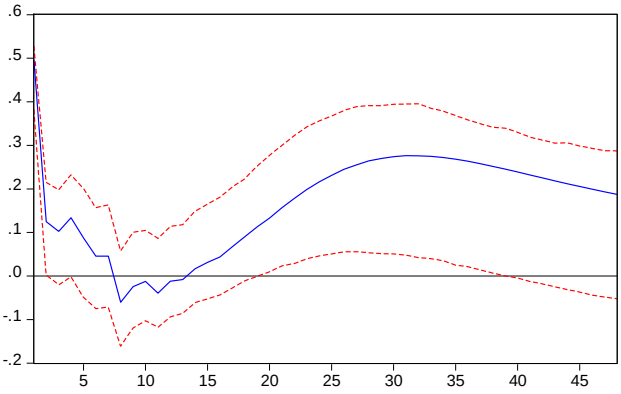
RICS England & Wales Housing Market Survey Price Balance SA



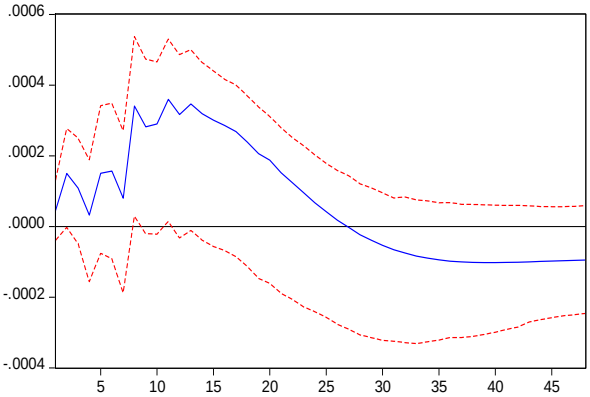
Average Weekly Earnings 3 Month Avg Growth Whole Economy YoY



UK AWE Regular Pay Whole Economy 3M Avg YoY SA

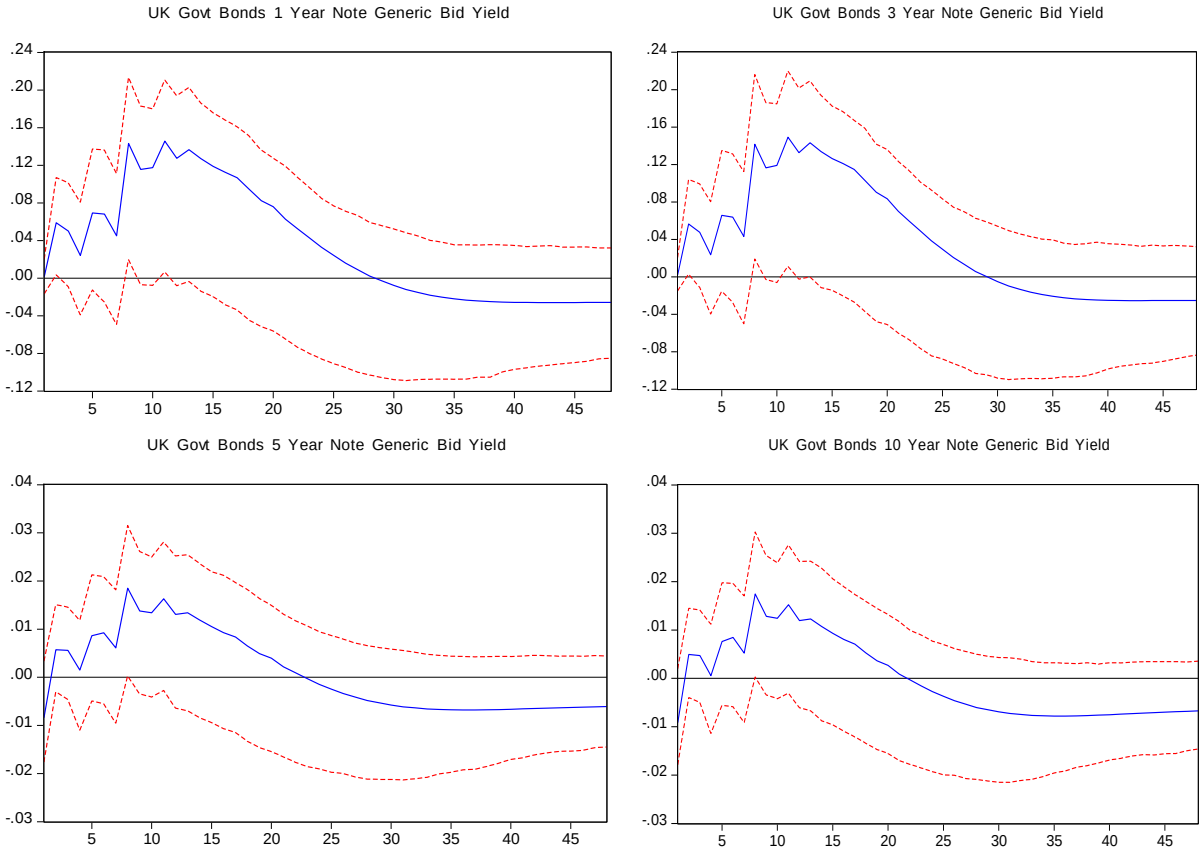


UK Official Reserves Changes in Net Reserves



Finally, we explore the impacts of optimism shocks on government bond yields. Figure 3.0 shows that all four government bond tenors somewhat respond to optimism shocks with rising yields, again mimicking the response to an interest rate rise.

Figure 3.0: Impulse response to Optimism Shocks (UK Government Bonds)



Conclusion

Traditional monetary policy tools of manipulating interest rates to achieve policy goals can be rather ineffective when interest rates are already close to the zero lower bound. Although an increasing number of central banks are turning to communication as an alternative policy tool to drive short term expectations, there is still no consensus on what dimensions of communication to measure and how these may quantitatively impact policy as interest rates would. Our study sought to address this by evaluating optimism of central bank communication as a dimension of communication that drives policy. We quantify optimism of monetary policy communication via MPC minutes using computerised textual analysis software. Using a FAVAR approach, we find that optimism shocks act in much the same way

as an interest rate rise would, a contractionary monetary policy. We find that following shocks to optimism, inflation rises, output falls, stock market returns fall and the Pound rises in value. We further find evidence that optimism shocks reduce credit availability, the money supply, retail sales as well as earnings. Finally, government bond yields also tend to rise in response to optimism shocks. These results are consistent with traditional economic theory as largely summarised in Sims (1992) and may provide central banks with an alternative approach to driving economic policy.

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